

Press Release

The redesign of Canal Plaza is an example of practical, community inspired design that transforms a previously underutilized space into a central access point in the heart of downtown Portland, Maine. The challenges faced by the master planning team which included architecture firm, Canal 5 Studios, and landscape designer, Michael Boucher Landscape Architecture (MBLA), were met with thought-provoking inspiration from the natural flow of pedestrians entering and exiting the three office buildings surrounding the area. The plaza, originally designed in the 1970's, created a perceived barrier of entry due to large, matured, trees that cast shadows within a condensed area. Opening the space to light was integral to the achievement of the design. After several proposed conceptual drawings, collaboration with the City, discussions with the owner, East Brown Cow Management, Inc., this experienced team of contractors and consultants developed Canal Zero. Intended for a unique tenant that could provide retail or restaurant services to invite visitors to interact with the space, the building took the shape of what the team describes as a "guitar pick". To meet the final design of the curvilinear form allowing for only three elements of exposed architectural concrete, the remainder balanced with walls of solid glass, Becker Structural Engineers, Inc. (BSE), was challenged with limited structural wall to support the roof slab expected to span distances of up to 50 feet. An evolution of design concepts addressed the unique geometry by providing post-tensioned reinforced beam sections within the depth of the flat plate and an innovative solution that would reduce overall slab weight called voided slab technology. The particular technology utilized by BSE was developed by Cobiax®, and is the first use of this product in New England. Voided slab technology is a series of plastic void formers manufactured from 100% recycled plastic, that are encased in the concrete slab and displace an equivalent volume of concrete. The achieved reduction of concrete weight in the slab maintained the strength capacity necessary for code. To improve deflection above the glass curtain wall below and eliminate the need for unsightly deflection joints, BSE proposed post-tensioning the beam sections. This technology counteracted downward deflections by stressing the beams to balance for most of the concrete dead load prior to the shored concrete placement. This is the 3rd project in the United States that has used post-tensioning systems in conjunction with the Cobiax® voided slab. To add to the challenges the team faced, several iterations of concrete admixtures were examined to determine the acceptable levels of self-consolidation, crack mitigation and shrinkage reduction to meet the ideal aesthetics. The overall design and use of non-traditional elements will differentiate and celebrate Canal Zero as a striking contrast to the common brick-and-box buildings that make up Portland's historic

identity, and will provide a new and interactive space for the community with its anticipated completion in October 2017.

About Us

Becker Structural Engineers, Inc. was founded in 1994. We have built a successful practice by providing practical, cost-effective and innovative solutions on a wide range of challenging projects. Project involvement includes a mix of new and existing buildings and facilities. Our substantial experience with contemporary building design is complemented by an extensive background renovating and restoring historic structures. Our performance based engineering perspective creates efficient, reliable designs. and our broad knowledge of building structures, building components and constructability provides a wealth of information to draw on. Our staff size ensures projects receive the attention they deserve and that project milestones are met. Building and design capabilities are complimented by our expertise in the functional planning, layout, access control, structural design and construction phase services which include construction reviews for general conformance as well as implementation and administration of the IBC Special Inspections Program. We believe a strong job site presence contributes to enhanced quality and improved construction efficiency. We coordinate architectural and mechanical systems to deliver a complete building and garage design package. In addition to our parking garage design and repair experience, we also provide design services to the precast concrete industry for architectural precast, and structural precast concrete. Our synergistic ability to design buildings, parking structures, and building components, provides one source for structural engineering needs.